Electoral Competition, Moderating Institutions and Political Extremism

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Abstract

Spatial models of electoral competition typically generate equilibria characterized by policy convergence and the median voter theorem. This paper assumes policy motivated parties who select candidates from various possible "types", and introduces two further elements: stochastic voting outcomes and Constitutional provision of some bargaining power to the Opposition in policy choice. As in Wittman [1983], Calvert [1985] and Roemer [1997], policy divergence results. It is shown that moderating institutions can have a perverse effect on policy—political systems that allow greater bargaining strength to the Opposition usually generate more extreme policies. Indeed, for an intermediate range of the Opposition's bargaining strength, we may have policy *extremism*, i.e, parties may implement policies more extreme than their *own* ideal points. Increased noise in voting and more extreme party tastes tend to generate more extreme policies. We also analyze a general model with fixed probabilities and find that policy extremism is almost always the case in this model. We discuss other applications involving delegated bargaining: oligarchies, secessionist movements and wage negotiations. Finally, it is shown that in an appropriately defined sense, elections have a moderating influence on policies, though post-election moderating institutions may not.

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1 Introduction

Spatial models of electoral competition typically generate equilibria characterized by *policy convergence* and the *median voter theorem*, i.e, in equilibrium, all candidates announce a policy platform which is identical to the most preferred policy of the median voter. Casual observation as well as careful studies reveal that these predictions are very much at odds with political reality. Political parties do choose very different platforms, and sometimes put up “hardliners” rather than moderates as leaders or candidates. I propose two amendments to the basic unidimensional voting model to capture this phenomenon: first, noisy voting outcomes; and second, constitutional provision of some bargaining power to the “Opposition” in the formulation of policy.

Casual observation of history as well as contemporary politics suggests that very extreme ideologies can survive and even thrive in competitive electoral environments. An often under-appreciated fact is that the Nazi Party rose to influence in Germany in the late twenties and early thirties, largely through considerable electoral success. More recently, the extreme nationalist BJP in India has, within the space of a decade, emerged from the political wilderness to become, first, a strong Opposition force, and eventually, the ruling party. It is unlikely that these radical parties represented mainstream opinion of the electorate. In this context, mention may also be made of the determined effort of the leaders of the Republican Party to impeach Bill Clinton, even in the face of persistent poll reports showing that general public opinion runs strongly against the President’s removal[2].

There is a large literature in empirical political science, documenting policy divergence and party polarization, specially in American politics. Analyzing survey data on a cross-section of voters, Poole and Rosenthal [1984a] show that most voters perceive candidates to occupy substantially different positions on the Liberal-Conservative ideological spectrum. Moreover, most respondents’ ideal points lie in between the candidates’ positions. Differences in candidates’ positions are not random, but systematically correlated with their party affiliations. Poole and Rosenthal [1984b] report that if the two senators of a State come from the same party, they tend to be very similar in their political stance, but highly dissimilar if they belong to different parties. Similar results are found for Congressional candidates in Fiorina [1973], Loomis and Poole [1992] and Poole and Romer [1993]. Hibbs [1977] shows how parties create macroeconomic policy cycles: data on 12 North American and West European countries show that left-wing or socialist administrations consistently produce higher inflation and lower unemployment compared to right-wing or conservative administrations.

[2] Since this is a controversial issue, let me add the clarification that this is merely a statement of facts, not an endorsement or criticism of the Republican position.

In a similar vein, Alesina and Rosenthal [1995] find that the one or two years immediately following a change from Republican to Democratic regimes produce higher growth and inflation rates. The message is clear: political parties and their candidates differ substantially in their choice of platforms and policies, far from the homogenization predicted by the median voter result.

The early theoretical literature, starting with Hotelling [1929], and especially Downs [1957], analyzed policy outcomes under the assumption that candidates or parties are motivated by the desire to capture office above anything else. In the light of the wealth of evidence partly cited above, there has been a considerable shift towards considering policy motivated parties, i.e, parties which care about policy outcomes and which bid for office as a *means* to carry out favorite policies, not as a *goal* in itself. This paper will follow the more recent tradition and make the latter assumption.

It is interesting to note, though, that the mere introduction of policy motivated parties in the Hotelling-Downs model does not break the median voter result. Suppose there are two parties whose most preferred policies are $\bar{x}$ and $\bar{y}$ on the [0, 1] interval, and suppose the median voter's ideal point is 1/2 (assume $\bar{x} < 1/2 < \bar{y}$)[3]. If party Y chooses some $y > 1/2$ as its platform, party X's best response is to announce a policy slightly closer to 1/2 than the "mirror image" $1 - y$. This will ensure victory, but more importantly, minimize distance from its own most preferred point[4]. However, party Y will then want to move a little closer to 1/2 itself, and the process will spiral down to the median.

However, a degree of uncertainty about the median voter's position, *together with* the assumption of ideologically motivated parties, generates policy divergence (see Proposition 1). In the presence of such uncertainty, voting outcomes are stochastic but the probabilities are dependent on the platforms of the candidates. Parties can then trade-off between adopting platforms or selecting candidates closer to their ideal points, and increasing the probability of victory by choosing more moderate (hence, from their perspective, more distant) positions. A number of papers in the literature, notably Wittman [1977, 1983], Calvert [1985] and Roemer [1997], have adopted this line of enquiry.

The main objective of this paper is not just to investigate whether policy divergence can arise in a reasonable model, but also what factors determine the *degree* of divergence in policies chosen by different parties. A natural question to ask is: how does the *design* of the Constitution and the details of the political system itself affect policy outcomes[5]. One

[3]If ideal points of both parties lie on the same side of the median, parties will still converge, but to the ideal point of the party closer to the median.

[4]If the most preferred point point $\bar{x}$ is to the right of $1 - y$, then X chooses $\bar{x}$ in best response.

[5]Observe that in any model of convergence, these details become logically redundant, suggesting that

important feature which begs for attention is the exact nature of division of power between the executive and the legislature (for Presidential systems) or the Cabinet and its Parliamentary opposition (for Parliamentary systems), or the contrast between the two systems themselves. Some Constitutions concentrate more power in the hands of the executive, some less; virtually none mandate an elected dictatorship, where the leader in office can implement *any* policy during her term, unopposed and unobstructed. While the role and strength of the Congress is probably laid down quite explicitly in the Constitution, the influence of the Opposition in Parliamentary governments is more subtle. It derives from its "voice" in Parliament and the media, and is likely to be more deeply imbedded in the political culture and custom than in the letter of the law. The *source* of the Opposition's strength is unimportant, what matters is its *effect* on policies.

Ordinary intuition suggests that political systems that allow for a stronger Opposition should, *ceteris paribus*, achieve more centrist policies, since the political bias of the executive will be nullified to a greater extent by the Opposition. The central, and most surprising, result of this paper is to show that this intuition is wrong. Moderating institutions (in the form of greater Opposition influence and similar "checks and balances") can have an entirely perverse effect on policy—making it more extreme rather than more moderate! Pushed sufficiently far, the result may be even more startling. In Parliamentary democracies that grant a certain minimum strength to the Opposition, political parties, once in power, may implement policies that are *more extreme than even their own ideal policies* (a term we refer to as policy extremism). Put another way, these parties may have actually implemented more moderate policies if they had dictatorial powers to begin with. What drives the result is that when the Opposition's seat is endowed with greater strength or influence over policymaking, parties will react by nominating more radical politicians as their leaders and electoral representatives[6] (to make the best of the worst-case-scenario). Since both parties do this, the result is an escalation in extremism, not merely in candidate profiles but also in *actual policy choices, ex post*, irrespective of who wins the election. The tentative conclusion is that greater concentration of power in the hands of the executive may actually be beneficial.

The only theoretical work I am aware of, that looks at the implications of Cabinet-Opposition or President-Congress interaction, and attempts to derive some form of institu-

institutional features of a country play no role in its political and economic choices. The model presented here not only reaches the opposite conclusion but also sheds some light on *how* these features might matter.

[6]Interestingly, Poole and Rosenthal (1991) find that Democrat as well as Republican Presidential candidates for the last hundred years have tended to occupy relatively extreme ideological positions *within their own parties*. Though this evidence is not an exact fit for our model, which relates to a Parliamentary system, my conjecture is that the same kind of trend will hold there too if we look at the data.

tional comparative statics, is the work by Alesina and Rosenthal [1992, 1995, 2000]. However, their earlier paper treats the positions of candidates as exogenous, and analyzes voting behavior and voter coalitions. Alesina and Rosenthal [2000] endogenizes candidate positions, but derives all results in the context of a Presidential form of government, as opposed to the Parliamentary system considered in this paper. Analytically, the main difference between the two models is that here, voters vote only once, which decides all aspects of government formation. In contrast, in Alesina and Rosenthal's work, voters vote twice—once to decide the Presidency, and again to decide the composition of the legislature. This flexibility (which allows, for example split-ticket voting, i.e. voting for opposing parties' candidates in the two elections) gives voters the power to achieve greater moderation in policies relative to the model here. Further, their results are not analytically derived but based on numerical simulations, and are therefore only suggestive. The simulations presented do not uncover an instance of policy extremism, but it is unclear whether such extremism can arise for other parameters or functional forms than the ones considered.

The outline of the basic model is as follows. There is a population of voters who have preferences defined over a single dimensional policy space (say the choice of a tax rate). Voters are heterogenous, with most preferred points distributed over the unit interval. There are two political parties, each representing the interests of a subset of the population. Each party has an ideal best point it would like to choose (which may be taken to be the most preferred point of the median member of its own constituency), but has to compete with the other party to gain office and obtain the power to implement policy. Before an election, both parties simultaneously put up candidates of given "types", who have distinct (commonly known) policy preferences *of their own*. Thus, parties can, and often will, select candidates whose tastes do not exactly coincide with that of their average member. In this sense, this is a model of *strategic delegation*.

We also assume, as stated before, that voting outcomes are noisy because of incomplete and stochastic turnout. Each candidate's probability of victory is a function of both candidates' types. Once a winner emerges from the elections, she assumes office and the loser assumes the role of an Opposition. The policy eventually implemented is a weighted average of the ideal policies of *both* the executive head and the Opposition, with more weight being placed on the preference of the former. In other words, by constitutional provision and/or political convention, the Opposition is endowed with some limited bargaining strength. We focus on the Nash equilibrium of the candidate selection game between the two parties, and its policy consequences.

Results show that, generically, there is *platform differentiation*, i.e, parties put up candidates who support policies that are distinct from each other. Candidate types or platforms can either be more moderate than the party's ideal point (i.e, removed towards the center), or more extreme (i.e, removed towards the corresponding extreme point), depending on parameter values. For high enough values of the Opposition's bargaining strength, there arises the phenomenon of *candidate extremism*—parties select candidates whose tastes are more extreme than the party's own (or that of its average member).

Constitutions that allow more say to the Opposition seem, on the face of it, to have built in stronger moderating influences into the wheels of government. In a more structured version of the model, comparative static results show that this can be false: more power to the Opposition generally implies the choice of more extreme policies, *ex post, once the equilibrium response of the parties has been taken into account*. If party candidates are not completely polarized to begin with, a parametric increase in the Opposition's bargaining strength leads to selection of more extreme candidates, the effect of which is strong enough to outweigh the moderating influence *per se*. Indeed, for an intermediate range of values of the bargaining parameter, there arises the surprising phenomenon of *policy extremism*—once candidates have been selected and election outcomes realized, the policy *actually implemented* (as opposed to merely the winning candidate's type) may be more extreme than even the winning party's most preferred point. The welfare implication of this result is immediate and stark electoral competition can lead to policy choices that are *ex post* Pareto inefficient, i.e, there may be alternative policies which *both* parties would have preferred. Our results suggest that elected dictatorships as well as complete "rule- by-consensus" systems are likely to produce more middle-of-the road policies than those which insist on limited agreements between the executive head and her political opposition.

Other comparative static results are also derived, under assumed functional forms, and these are along the lines of common intuition. In particular, more noise in voting outcomes leads to more extreme candidates as well as policies, and parties with more extreme tastes implement more extreme policies. In a later section, we study a version of the model where the probability of each party being a winner is fixed and not dependent on the candidates' positions. This version of the model generates similar results, only with greater sharpness and generality. As a matter of fact, policy extremism and inefficient policy choices *always* arise in this model, unless ex post bargaining strengths are very close. This version has wider applications, and can be thought of as a general model of delegated bargaining, when each party's bargaining strength is unknown (but the uncertainty is exogenous). We discuss three applications: oligarchies, ethnic conflict and secessionist movements, and wage bargaining. Finally, by comparing the two variants of the model, we show that in an appropriately defined sense, elections do have a moderating effect on policy outcomes.

The current version of the paper is very much incomplete. Ongoing research is focusing on the same set of issues applied to Presidential forms of government. In a future draft, I hope to incorporate results from this analysis.

The rest of the paper is organized as follows. Section 2 presents the model and defines an electoral equilibrium. Section 3 takes up welfare issues and the definition of new terms introduced. Section 4 discusses properties of the equilibrium. Section 5 presents the fixed-probability model and discusses applications.

2 A Model of Parliamentary Government

There is an electorate consisting of a continuum of agents, who have preferences defined over a one-dimensional policy space[7]. We take the policy space to be the unit interval [0, 1]. Every member of the electorate has a most preferred policy, and an utility function which is decreasing in the distance from the most preferred point. In particular, we specify the following utility function: when policy p is chosen, a voter whose most preferred policy is z receives an utility given by the following function:

$$U = U(p - z) \tag{1}$$

We assume that U is twice differentiable and concave in its argument. Concavity implies risk-aversion on the part of voters, i.e, given a probability distribution over policies, voters will always prefer the expected policy over the distribution. We normalize by setting $U(0) = 0$. Note also that concavity implies $U^{'}(0) = 0$. The above specification also implies that preferences are single-peaked, symmetric around the "bliss point", and that voters are identical except in their choice of most preferred policy.

There are two political parties, X and Y. Parties have policy preferences of their own. In particular, we assume that parties have the same utility functions as voters, with their bliss points being $\bar{x}$ and $\bar{y}$ respectively. Without loss of generality, let $\bar{x} < \bar{y}$. These values may be interpreted as capturing the preferences of the median member of each party. Thus, if party X (Y) had dictatorial powers over policy, it would implement policy $\bar{x}$ ($\bar{y}$). Party preferences are common knowledge.

[7]One dimensionality might seem restrictive; see however Rosenthal and Poole [1991] , and Heckman and Snyder [1992] for evidence that roll call voting patterns for Senators and members of Congress can be explained by a single dimensional Liberal-Conservative spectrum.

Before an election, each party nominates a "candidate" to run for office. The choices are simultaneous. Candidates have policy preferences of their own. Any candidate's preferences are, once again, common knowledge. Once in office, candidates act strictly in accordance with their *own* preferences[8]. An alternative interpretation of the model could be that before elections, each party announces a "platform"— a policy it would ideally like to implement if in office. The actual policy implemented by the party need not coincide with this platform (due to institutional obligations to bargain with the opposition and make compromises, which will be outlined in a moment), but the party makes a binding promise to act as if it wants to implement its announced platform. We choose the first interpretation, since it is more natural in this context.

Suppose party X (Y) nominates a candidate with most preferred point (or of "type") $\hat{x}(\hat{y})$. Suppose the candidate of party X wins the election and assumes office (electoral chances of each party will be discussed shortly). In that case, the losing candidate (party Y's nominee) assumes the role of Opposition. We assume that the implementation of policy is the result of the outcome of bargaining between the Executive and the Opposition. Let $x(y)$ denote the policy outcome in the event of electoral victory for party X's (Y's) candidate. These are given by the following rules:

$$x = \theta\hat{x} + (1-\theta)\hat{y} \tag{2}$$

$$y = \theta\hat{y} + (1-\theta)\hat{x} \tag{3}$$

where the parameter $\theta \in [1/2, 1]$. Thus, we postulate that actual policy is a weighted average of *both* the Executive head's ideal policy as well as that of the Opposition, with more weight placed on the former. The parameter θ has rich interpretations. It (rather $(1-\theta)$) represents the Opposition's "voice" in government policy making. All democracies, to varying extents, allow some limited influence to Opposition members in Parliament (or Congress) in the business of government The exact value of θ will be determined by Constitutional provisions as well as political custom and convention. We do not attempt to uncover the process of

[8]This assumption of ideologically rigid politicians may be controversial with some readers, but is actually well supported by data from American politics. Poole and Rosenthal [1991], analyzing data on roll-call voting in the Congress and Senate, show extremely stable positions of individual Senators and Congressmen on the ideological spectrum. In the words of Alesina and Rosenthal [1995], "they enter and die with their ideological boots on!" Loomis and Poole [1992] and Poole and Romer [1993] find evidence that when term limits apply, politicians' behavior in the last term (when incentives are very different) do not show a significant departure from their previous trend, further reinforcing the notion of fixed "types".

determination of θ, and take it as a parameter instead. One important objective of this paper is to study the implication of allowing Opposition influence in policy making.

There are two important points worth mentioning here. First, the linear functional form specified above is special, and one could in principle carry out the same analysis with more general forms. However, we show in section X that for a large class of utility functions, and in an appropriate limit, the Nash bargaining solution between the executive and the Opposition will have the above linear form. Thus, our assumed equations have reasonably strong micro-foundations.

Second, the special cases where θ is either $1/2$ or 1 are of some interest. $\theta = 1$ represents an "elected dictatorship" (in a specific and narrow sense), where the elected leader faces absolutely no constraint in the exercise of power to choose policy. Related papers in the literature (Calvert [1985], Wittman [1977, 1983]) have implicitly focused on this case. The opposite extreme case of $\theta = 1/2$ can be interpreted as a complete "rule-by-consensus" system, where the identity of the winner is immaterial—all participants have equal bargaining strength. Examples may include such bodies as jury boards and certain committees, or non-elected community leaderships.

We next turn to the question of who wins the election. We assume that voting outcomes are stochastic, but the probabilities depend on the position of candidates in the policy spectrum. We assume that voters vote in accordance with the principle of *conditional sincerity*, as stated in Alesina and Rosenthal [1995]. In other words, every voter casts a ballot in favor of the candidate closest to her ideal point[9]. It is easy to see that z, the most preferred policy of the median voter in the *voting population* will determine the identity of the winner. If the median voter *strictly* prefers x to y, so will a majority of voters, and the candidate of type x will win. In the case of indifference on the median voter's part, there will be a tie, and we can make the assumption that each candidate wins with a probability of $1/2$ in that case (the results are unchanged for any other tie-breaking rule). The question then boils down to where the candidates stand vis-a-vis the median voter. The next crucial assumption of the model is that the exact position of the median voter is not known by parties in advance, and is distributed according to the distribution $F(z)$. Hence, $F(z_0) = \text{Prob}\{z \leq z_0\}$.

There are a number of different ways in which this assumption may be justified, and a number of different "stories" to go alongwith. One interpretation is that there may be last minute "preference shocks" to the electorate (Alesina and Rosenthal [1995]). Alternatively, there may be "noise voters" like noise traders, who vote randomly. Another possibility is

[9]Strictly speaking, since each voter is atomistic, she should be indifferent between voting for either candidate, or not voting at all. However, if we assume costless voting, and an $\epsilon > 0$ amount of "warm-glow" utility from voting for the "right guy", the principle of conditional sincerity follows.

that voter participation is stochastic, rendering the position of the median voter stochastic (Roemer[1997])[10]. The most straightforward interpretation would be to say that parties are simply uncertain about where the average opinion lies. I will adopt the stochastic formulation, leaving the interpretation to the taste of the reader[11]

Given choices of $\hat{x}$ and $\hat{y}$, we can now write down each candidate's probability of victory. If voters are forward looking, they will vote not in accordance with $\hat{x}$ or $\hat{y}$, the candidate's preferences, but x and y, the policies they will implement if in office. However, whether voters are astute in this sense, or nave, turns out to be immaterial. If $\hat{x}$ is closer to a voter's ideal point relative to $\hat{y}$, then so will be x relative to y. In particular, if the median voter's position z is to the left of the "mid-point" $(\hat{x}+\hat{y})/2 = (x+y)/2$, then she will vote for the X candidate. Otherwise, she will vote for Y. Denote by $\Pi(x,y)$ the probability of winning for a candidate who would implement policy x if elected, while her opponent will implement y $(x<y)$. Then, we have

$$\Pi(x,y) = F\left(\frac{x+y}{2}\right) = F\left(\frac{\hat{x}+\hat{y}}{2}\right) \tag{4}$$

The probability of candidate Y winning can be similarly expressed. For $x<y$,

$$\Pi(y,x) = 1 - F\left(\frac{x+y}{2}\right) = 1 - F\left(\frac{\hat{x}+\hat{y}}{2}\right) \tag{5}$$

The model, then, boils down to a simple delegation game. Each party selects a candidate from the range of feasible types (which we take to be the entire policy space). Once a candidate is selected, she pursues policies strictly in accordance with her *own* tastes. Of course, for strategic reasons, parties may want to, and usually will, select candidates whose tastes do not coincide with that of their own. The purpose of the model is to study the nature of this distortion, and more importantly, its implications on choice of policy.

Nash equilibrium requires that parties select candidates who are best responses to each other, given their objectives. Since, in this model, parties are fundamentally interested in policy, not winning, they will act as von Neumann utility maximizers to select their candidates. The selection problem for party X may be represented as follows:

$$\max_{\hat{x}} \Pi(x,y)U(x-\bar{x}) + [1-\Pi(x,y)]U(y-\bar{x}) \tag{6}$$

[10] For this interpretation, we have to assume that participation rates may be correlated with preferences, and may be different for different groups. If all cohorts of citizens have the same participation rates, the effects will wash out. However, newspaper reports often report how greater or lesser participation by a minority or ethnic group (whose preferences are usually highly correlated) caused a swing in an election result.

[11] Given uncertainty about the taste of the median reader, this seems to be the best policy!

The equivalent problem for party Y is:

$$\max_{\hat{y}} \Pi(y,x)]U(y-\bar{y}) + [1-\Pi(y,x)]U(x-\bar{y}) \tag{7}$$

The solutions to the two problems above yield the "reaction functions" of the parties. Notice that though the choice variables are $\hat{x}$ and $\hat{y}$, the reaction functions can always be transformed to be expressed in terms of x and y alone. We express reaction functions generally in the following form:

$$R_x(x,y) = 0 \tag{8}$$

$$R_y(x,y) = 0 \tag{9}$$

The Nash equilibrium of this game is a vector $(\hat{x}^*, \hat{y}^*, x^*, y^*, \Pi_x^*, \Pi_y^*)$ such that $(\hat{x}^*, \hat{y}^*)$ are best responses to each other, the contingent policies x^* and y^* are derived from $\hat{x}^*$ and $\hat{y}^*$ in accordance with (2) and (3), and the probabilities of victory for candidates X and Y, Π_x^* and Π_y^* are given by $\Pi(x^*, y^*)$ and $\Pi(y^*, x^*)$ respectively. We will refer to such a configuration as an *electoral equilibrium*.

It is instructive to look at the first-order conditions that define the reaction functions in (9) and (10). The standard Kuhn Tucker conditions applied to party X's problem yields:

$$\theta\Pi(x,y)U^{'}(x-\bar{x}) + (1-\theta)[1-\Pi(x,y)]U^{'}(y-\bar{x}) \leq \Pi^{'}(x,y)[U(y-\bar{x}) - U(x-\bar{x})] \tag{10}$$

with equality holding whenever the solution is $\hat{x} > 0$, and where $\Pi^{'}(x,y) = dF(x,y)$ captures the increase in the probability of a win if party X chooses a candidate slightly more towards the center. The corresponding condition for party Y is

$$(1-\theta)\Pi(x,y)U^{'}(x-\bar{y}) + \theta[1-\Pi(x,y)]U^{'}(y-\bar{y}) \geq \Pi^{'}(x,y)[U(x-\bar{y}) - U(y-\bar{y})] \tag{11}$$

with equality holding whenever the solution is $\hat{y} < 1$.

Suppose optimum choices are in the interior. Then the above inequalities hold as equalities. Each side of these equations, then, has an important intuitive explanation, which greatly facilitates our understanding of the workings of the model. Look at the left hand side of (10), which is a probability weighted sum of marginal utilities with respect to distance. It captures what we will call the *policy shifting effect*. If party X moves the current position of its candidate slightly to the left, it shifts (holding fixed its rival party's choice) the policies to be implemented in either eventuality (win or loss) to the left and closer to its ideal point[12] This effect tends to push choices towards the extreme. On the other hand, changing the position of its candidate also has an effect on probabilities. If the candidate's position is moved slightly to the right, some probability weight is shifted from the unfavorable (i.e, loss; bargaining power $= 1 - \theta$) to the favorable outcome (win; bargaining power $= \theta$). We call this the *probability shifting effect*. It is captured in the right hand expression in (10). This effect tends to push choices in the direction of moderation, quite contrary to the policy shifting effect. In any interior equilibrium, the two effects must be equal and opposite at the margin. Hence, the equality must hold. Party Y's choice problem is exactly analogous.

Insert Figure 1 here.

The equilibrium can be demonstrated graphically, as shown in Figure 1. But first note that to conduct the analysis in the space of policies (x, y) rather than candidates $(\hat{x}, \hat{y})$, only a feasible subset of the policy space must be considered. We can invert (2) and (3) to write

$$\hat{x} = \frac{\theta x - (1-\theta)y}{2\theta - 1}$$

$$\hat{y} = \frac{\theta y - (1-\theta)x}{2\theta - 1}$$

Feasibility requires that $\hat{x} \geq 0$ and $\hat{y} \leq 1$[13]. On using the above inverse functions and after some manipulation, we obtain the following bounds imposed by feasibility:

$$\theta x \geq (1-\theta)y \tag{12}$$

$$\theta y \geq (1-\theta)x + (2\theta - 1) \tag{13}$$

In Figure 1, a graphical representation of an electoral equilibrium is provided. The unit square captures all possible policy combinations (x, y). Since party X will typically choose $\hat{x} < \hat{y}$, implying $x < y$, we can restrict attention to the region above the diagonal. The feasible set of policy combinations is given by the shaded region in the two panels. Party

[12]Unless x is already to the left of $\bar{x}$, in which it makes its own candidate's winning policy more distant from its ideal point, but the opponent's candidate's implemented policy, in case the latter wins, closer. The net effect may be positive or negative.

[13]Given the nature of incentives, the other pair of inequalities will always be satisfied and need not be worried about.

reaction functions start from their own ideal points (since $\hat{x} = \bar{x}$ whenever $\hat{y} = \bar{x}$, etc.). The slopes may be positive or negative. If the reaction curves intersect inside the feasible subset of policies (panel (a)), we have an interior equilibrium. If they hit the boundary of the feasible set without an intersection inside, then the equilibrium is obtained at the boundary, and one or both candidates are completely polarized ($\hat{x}^* = 0$ and/or $\hat{y}^* = 1$). Panel (b) shows a completely polarized equilibrium.

3 Some Definitions and Welfare Issues

Discussion of welfare issues in a spatial voting model comes to a stall if we insist on the notion of Pareto efficiency applied to the entire population. If the distribution of tastes has a support equal to the entire policy space, then *any* policy is Pareto optimal, and there is nothing much more to talk about. However, there is a strong, intuitive (if somewhat fuzzy) sense in which policies closer towards the "center" (i.e, towards the preferred outcome of the median member of the population) are superior to those which are towards either extreme. One way to capture this idea is to specify an utilitarian social welfare function, which is the integral over all agents' utilities. It is easy to see that with utility being concave in distance, the most efficient utilitarian policy is the one which coincides with the median citizen's bliss point. Herein lies the normative appeal of the median voter theorem—the "invisible hand" of political competition is seen to lead to the best utilitarian policy being chosen, achieving the "the greatest good for the greatest number"[14].

We can go beyond such utilitarian analysis and analyze policy outcomes from the perspective of the *parties themselves*. This is natural, since the parties are the important players in the game, with preferences of their own, and are the ones who fundamentally shape policies through their choice of candidates. Further, if they have roughly equal support bases, then each party represents about half the population, and each party's preference represents the average opinion in their respective half. Viewed from this angle, we find only a subset of policies to be Pareto optimal—those lying in between the most preferred points of the two parties, i.e, in the interval $[\bar{x}, \bar{y}]$. Any policy lying outside this range, either to the left of the Left party's ideal point $\bar{x}$, or to the right of the Right party's ideal point $\bar{y}$, will be Pareto inefficient (from the point of view of the parties themselves). If political candidates were honest representatives of a party's true outlook, they would never bargain for policy choices

[14] An alternative Rawlsian interpretation of the median voter's bliss point as socially the most efficient choice, is possible. Suppose citizens are unaware what their true preferences are going to be, but know that their most preferred point will be drawn randomly from the distribution that is going to prevail in the population. Behind this "veil of ignorance", all voters will want the median policy to be selected.

outside the Pareto efficient set.

At this point, for brevity of reference, we introduce a few terms.

Definition 1. An equilibrium is said to exhibit *policy divergence* if $x^* \neq y^*$.

Policy divergence is the most general form of departure from the median voter theorem, which predicts policy *convergence*. The question that follows is: to what *extent* do policies diverge? Is there a natural bound, policies beyond which will not be observed in equilibrium? Simple intuition suggests that party ideal points should serve as such bounds. After all, what does a party have to gain by implementing a policy which is further towards the extreme than it really wants, when a policy slightly more removed towards the middle will be unanimously preferred by itself as well as its rival party (and, most likely, by a majority of the voters too)? Indeed, to the best of my knowledge, all the papers in the literature (which take into account similar factors, except for Opposition influence in policy-making) predict that divergent policies will still be restricted to the "moderate zone" $[\bar{x}, \bar{y}]$ (see Proposition 2 below). The results of this paper will show that this is not necessarily the case.

The above discussion motivates the following definitions.

Definition 2. Party X (Y) is said to exhibit *candidate moderation* if $\hat{x}^* > \bar{x}$ ($\hat{y}^* < \bar{y}$), i.e, if in equilibrium, the party selects a candidate whose preferences are more moderate than that of its own. On the other hand, party X (Y) is said to exhibit *candidate extremism* if $\hat{x}^* < \bar{x}$ ($\hat{y}^* > \bar{y}$), i.e, if it nominates a candidate whose tastes are more extreme than its own.

Given the bargaining structure, and strategic motives behind delegation, it is perhaps not surprising that parties may often nominate extreme candidates. However, political candidates are merely instruments or agents; what is more important is the nature of the policy eventually chosen. Thus, we define the following:

Definition 3. Party X (Y) is said to exhibit *policy moderation* if $x^* > \bar{x}$ ($y^* < \bar{y}$), i.e, if the party, once in office, will implement a policy more moderate than what it would ideally like. On the other hand, X (Y) is said to exhibit *policy extremism* if $x^* < \bar{x}$ ($y^* > \bar{y}$), i.e, if the party will implement a policy more extreme than its ideal point, if it comes to power.

As noted earlier, we may want to make welfare evaluations of policy outcomes using the parties' *own* yardsticks (i.e, their respective utility functions) for the purpose. A distinction can be made here between *ex ante* efficiency and *ex post* efficiency. Notice that if we replace the two equilibrium policy outcomes x^* and y^* by the *expected* policy $\Pi^*_x.x^* + \Pi^*_y.y^*$, risk aversion implies that the *expected* utility of each party (as well as every citizen) increases strictly, whenever $x^* \neq y^*$. However, *once a specific policy (say x^*) has been selected*, there is an alternative policy which will increase both party's utility if and only if $x^* \notin [\bar{x}, \bar{y}]$.

FACT 1. *An electoral equilibrium is ex ante Pareto inefficient if it exhibits policy divergence.*

FACT 2. *An electoral equilibrium is ex post Pareto inefficient if and only if it exhibits policy extremism.*

These facts are self-evident after the discussion above.

4 Electoral Equilibrium

We start out by outlining some of the basic features of an electoral equilibrium. The first thing to note is that whenever parties have different tastes, they must select different candidates. In other words, the median voter theorem immediately breaks down in this model.

PROPOSITION **1** *The equilibrium exhibits policy divergence, i.e, $x^* \neq y^*$ if and only if $\bar{x} \neq \bar{y}$.*

PROOF: Suppose $\bar{x} \neq \bar{y}$ but $x^* = y^* > \bar{x}$. Party X, then, receives an equilibrium payoff of $U(x^* - \bar{x})$, which has a negative slope at $(x^* - \bar{x})$. Consider $\hat{x}^{'} = \hat{x}^* - \epsilon$, where $\epsilon > 0$ is small. Then, the induced policies are $x^{'} = \theta(\hat{x}^* - \epsilon) + (1-\theta)\hat{y}^* = x^* - \theta\epsilon$ and $y^{'} = \theta\hat{y}^* + (1-\theta)(\hat{x}^* - \epsilon) = x^* - (1-\theta)\epsilon$. In the case of such deviation, party X receives an expected utility of

$$\Pi(x^* - \theta\epsilon, x^* - (1-\theta)\epsilon)U(x^* - \theta\epsilon - \bar{x}) + (1 - \Pi(x^* - \theta\epsilon, x^* - (1-\theta)\epsilon)U(x^* - (1-\theta)\epsilon - \bar{x})$$

which is greater than $U(x^* - \bar{x})$ for ϵ small. Hence, a small deviation is beneficial for party X, which breaks the proposed equilibrium. The only if part of the Proposition is trivial. □

Thus, policy divergence is a matter of course in this model. We next show that when $\theta = 1$, in spite of some divergence, policy outcomes are still restricted to be moderate.

PROPOSITION **2** (Wittman [1983], Roemer [1997]) *Suppose $\theta = 1$, i.e, the Opposition has no influence in policymaking. Then, $\bar{x} \leq x^* < y^* \leq \bar{y}$, i.e, the equilibrium always exhibits policy moderation (and candidate moderation as well).*

PROOF: First, note that when $\theta = 1$, $x = \hat{x}$ and $y = \hat{y}$, i.e, candidates will implement their most favorite policies. Suppose $x^* < \bar{x}$. If $y^* > \bar{x}$, party X strictly increases its expected utility by choosing $\bar{x}$ instead of x^*. This is because both the probability of a win goes up (since $\Pi(x, y^*)$ is increasing in x for $x < y^*$), and so does the utility in the event of victory, while the utility in the event of a loss ($U(y^*)$) is unaffected. By exactly the same reasoning, when $y^* > \bar{x}$, party X does better by choosing y^* instead of x^*. Hence $x^* < \bar{x}$ can never be a best response. $\square$

Characterizing the solution to the general case ($\theta < 1$) with minimal structure on the functions, is a difficult problem. I have so far been unable to find fairly general conditions under which an equilibrium exists, and is unique. However, a lot of insight can be gained, and some intriguing possibilities uncovered, by focusing on an example with fully specified functional forms. Hence, we assume that $F(.)$ describes the uniform distribution over the interval $[(1-d)/2, (1+d)/2]$. Then $dF(.) = 1/2d$. We also assume that preferences take the quadratic form:

$$U(z) = -z^2$$

Finally, we impose symmetry on party positions, i.e, $\bar{y} = 1 - \bar{x}$. Hence, parties' ideal points are equidistant from the expected position of the median voter. It can be shown that if d is large enough, party objective functions are concave in the choice variables, and best response functions are continuous, guaranteeing the existence of an equilibrium. We analyze the symmetric equilibrium of this game, where $y^* = 1 - x^*$. Due to symmetry, in equilibrium, $\Pi_x^* = \Pi_y^* = 1/2$.

Assuming for the moment an interior equilibrium, we can use party X's first-order condition (10) to write:

$$\theta(x^* - \bar{x}) + (1-\theta)(1 - x^* - \bar{x}) = \frac{1}{2d}.[(1 - x^* - \bar{x})^2 - (x^* - \bar{x})^2]$$

This single equation yields a closed-form solution for the equilibrium policy x^* (and its mirror image y^*) in terms of the parameters of the model: $\bar{x}, \theta, d$. Note, however, that the feasibility constraint in (12) implies:

$$\theta x^* \geq (1-\theta)(1-x^*)$$

which simplifies to $x^* \geq (1-\theta)$. The equilibrium value of x must be the one obtained from the previous equation, as long as it is greater than $(1-\theta)$, and is equal to $(1-\theta)$ otherwise. After some manipulation, we obtain:

$$x^*(\theta, \bar{x}, d) = \max\left\{\frac{1}{2}.\left[1 - \frac{d(1-2\bar{x})}{1 - 2\bar{x} + d(2\theta - 1)}\right], (1-\theta)\right\} \tag{14}$$

Obtaining the comparative static effect of a change in parameters is now a straightforward exercise. We summarize the results below.

PROPOSITION **3** (Moderating institutions can lead to extreme policies). *Assume quadratic utility, uniform distribution of the median voter's position with spread d, and symmetric party positions. For any interior symmetric equilibrium, the following parametric changes lead to a fall in x^* (i.e, equilibrium policies become more extreme): (i) a decrease in θ (increase in the Opposition's influence on policymaking) (ii) an increase in d (more noise in voting outcomes), and (iii) a decrease in $\bar{x}$ (more extreme party preferences). If the equilibrium is not interior, then a decrease in θ causes an increase in x^*, while changes in the other parameters have no effect on equilibrium policy.*

PROOF: These results are easily obtained by differentiating the expression for x^* in (14) with respect to the different parameters. □

Changes in voting noise or parties' tastes have effects that are entirely in line with what intuition would suggest. What is striking, however, is the effect of a change in θ, when party candidates are not completely polarized to start with. When θ decreases, the Opposition has more influence on policy choice. Given that the Executive and the Opposition belong to opposite ideological camps, one might expect policies to be pulled closer to the center in this scenario. Surprisingly, we find that exactly the opposite is the case! Constitutions which insist on greater consensus between the ruling party and its Parliamentary opposition end up producing more extreme policy choices. Apparent forces of moderation have an entirely perverse effect!

A little reflection will show how this possibility arises. When the Opposition's constitutional strength increases, policies will become more moderate, *provided parties did not reshuffle the kind of candidates they select*. Of course, parties will react to this change in the political system. In particular, parties will now want to select more extreme candidates, since, in case they lose, these candidates can become very effective as the Opposition in Parliament. The *net* effect on policies depends on which is stronger: the moderating effect of greater Opposition strength *per se*, or the opposite strategic effect arising from more extreme candidate selection. While there is no clear intuition as to whether things will always be resolved one way or another, this specific example shows that the perverse effect could quite easily arise. The effect of institutional moderation may be more than wiped away by more radical politicians grabbing center-stage.

The remaining question is: can things get so much worse that policy extremism results, i.e, parties that come to power end up implementing policies that are more extreme than what they would have chosen, if they had dictatorial powers at the outset? The answer to this question is, sadly, yes. Let us see why.

In order for policy extremism to arise, two conditions must be satisfied simultaneously:

$$\begin{aligned} \bar{x} &> \frac{1}{2}.\left[1 - \frac{d(1-2\bar{x})}{1-2\bar{x}+d(2\theta-1)}\right] \\ \bar{x} &> 1-\theta \end{aligned}$$

Simple manipulation yields the pair of conditions:

$$1 - 2\bar{x} < 2d(1-\theta) \tag{15}$$

$$\theta + \bar{x} > 1 \tag{16}$$

Figure 2 shows the region of the parameter space in $(\theta, \bar{x})$ where (15) and (16) are satisfied, assuming $d = 1$. It is easy to see that this region is an area included between the two diagonals, and covers one-fourth of the total area of the parameter space. Thus, if preferences and bargaining parameters were drawn at random in this example, there is a 25% chance that policy extremism would arise! A decrease in d (less noise in the outcome of elections) reduces the subset of the other parameters that cause extremism. We summarize these findings in the next Proposition.

PROPOSITION **4** *Assume preferences are quadratic, party ideal points are symmetric and the position of the median voter is uniformly distributed around 1/2 with spread d. Then, if parameters satisfy (15) and (16) above, policy extremism results in equilibrium. The region of the parameter space thus defined is non-empty.*

PROOF: See the discussion above. □

We now turn to turn to a special version of the model, where the probability of a party's obtaining stronger bargaining position is fixed, and is not determined through the electoral process. This allows us to study the role of elections themselves, by filtering out the effect of other factors. It is also found that the perverse effects which are only *possibilities* in this section, turn out to be practically *certainties* in the next., and can be shown to hold very generally. The fixed-probability version of the model has applications beyond the realm of electoral competition, to many situations involving delegated bargaining.

5 Fixed Probabilities: Delegated Bargaining When Bargaining Strengths are Unknown

In the electoral model presented so far, parties face uncertainty regarding what bargaing strength (θ or $1-\theta$) their candidate will enjoy when the haggle over policy formulation starts. If the party's candidate is the winner at the polls, she will be in a stronger bargaining position than if she were a loser. What is important is that in either position, she is going to have *some* influence over policy. In the electoral model, the probability of obtaining a strong bargaining position (winning the election) or a weak one (i.e, losing it) is endogenous, and dependent on the chosen candidates' preferences or platforms. *Ceteris paribus*, more moderate candidates are more likely to win. We can think of a model where these probabilities are fixed instead: where two players (parties) delegate the task of bargaining on their behalf to independent agents who have preferences of their own, and there is *exogenous* uncertainty regarding the delegates' possible bargaining strengths. Various applications of this simpler model are possible, and will be discussed below. Analytically, this seems like a retrogade step after the previous section, but the conceptual purpose of this exercise will become clear by the end of this section.

Consider two modifications to the model of the previous section. First, suppose the probability of party X's candidate winning, and obtaining the stronger bargaining position θ, is some fixed parameter Π, *independent* of the positions of X and Y's candidate. Of course, then, with probability $1-\Pi$, X will have the weaker bargaining strength of $1-\theta$. The second modification lies in discarding the bargaining "rule-of-thumb" specified in (2) and (3), and explicitly adopting the Nash-bargaining solution instead. Thus, when candidates have bliss points $\hat{x}$ and $\hat{y}$, the bargaining set $B_{\hat{x}\hat{y}}$ defined in utility space is given by:

$$B_{\hat{x}\hat{y}} = \{(pU(z_1-\hat{x})+(1-p)U(z_2-\hat{x}), pU(z_1-\hat{y})+(1-p)U(z_2-\hat{y}))|z_1, z_2, p \in [0,1]\} \quad (17)$$

Essentially, the bargaining set is constructed by considering all possible policies, including randomized choice of policies (hence the p), and computing the corresponding vector of utilities. Concavity of the utility function implies that the bargaining set is convex, with the boundary points corresponding to deterministic policy choices (i.e, $p = 0$ or 1 on the boundary). Further, since the policy set is closed, so is B. We conclude that the bargaining set is compact.

To this bargaining set, we apply the (asymmetric) Nash bargaining solution[15]. When party X's candidate is "strong", i.e, has bargaining power θ, the policy chosen is the solution

[15]See Myerson [1991] or Osborne and Rubinstein [1994].

to the problem:

$$\max_{U_{\hat{x}}, U_{\hat{y}}} [U_{\hat{x}} - v]^{\theta}[U_{\hat{y}} - v]^{1-\theta} \qquad \text{subject to} \quad (U_{\hat{x}}, U_{\hat{y}}) \in B_{\hat{x}\hat{y}} \tag{18}$$

where v is the (common) disagreement payoff obtained in the case of a "deadlock", i.e, when politicians fail to agree on any policy whatsoever. The solution to the bargaining game when party X's candidate is "weak" and has bargaining power $1 - \theta$ is given by

$$\max_{U_{\hat{x}}, U_{\hat{y}}} [U_{\hat{x}} - v]^{1-\theta}[U_{\hat{y}} - v]^{\theta} \qquad \text{subject to} \quad (U_{\hat{x}}, U_{\hat{y}}) \in B_{\hat{x}\hat{y}} \tag{19}$$

Let $\tilde{x}(\hat{x}, \hat{y}, v)$ denote the Nash bargaining solution when candidate X is strong (has bargaining power θ) and $\tilde{y}(\hat{x}, \hat{y}, v)$ the corresponding solution when candidate Y is strong. Obviously, the solution will depend on the candidates' most preferred points as well as their disagreement payoffs. Standard tangency conditions of the Nash bargaining solution yields:

$$\begin{aligned}
\frac{\theta[U(\tilde{x} - \hat{x}) - v]}{(1-\theta)[U(\tilde{x} - \hat{y}) - v]} &= \frac{U'(\tilde{x} - \hat{y})}{U'(\tilde{x} - \hat{x})} \\
\frac{(1-\theta)[U(\tilde{y} - \hat{x}) - v]}{\theta[U(\tilde{y} - \hat{y}) - v]} &= \frac{U'(\tilde{y} - \hat{y})}{U'(\tilde{y} - \hat{x})}
\end{aligned}$$

Since v is the utility received in case of total failure to choose *any* policy (which is equivalent to total breakdown of the political system), it is reasonable to assume that it is much lower in magnitude relative to even the least preferred policy being chosen. It is natural, then, to look at the limiting values of the solutions as $v \to -\infty$. Let $x(\hat{x}, \hat{y})$ and $y(\hat{x}, \hat{y})$ denote these limiting solutions. By taking the appropriate limits in the expressions above, the equations simplify substantially, with the limit of the expressions on the left hand side becoming unity. Thus the limiting bargaining solutions are given by the simple equations:

$$\theta U'(x - \hat{x}) + (1-\theta)U'(x - \hat{y}) = 0 \tag{20}$$

$$\theta U'(y - \hat{y}) + (1-\theta)U'(y - \hat{x}) = 0 \tag{21}$$

If preferences belong to the class of functions $U(z) = -z^{\sigma}$ (where $\sigma > 1$), then the above equations yield bargaining solutions that are weighted averages of $\hat{x}$ and $\hat{y}$, e.g

$$x = \lambda(\theta)\bar{x} + (1 - \lambda(\theta))\bar{y}$$

where $\lambda(\theta)$ depends on θ in an increasing monotone manner, lies between 0 and 1, with end point conditions: $\lambda(1) = 1$ and $\lambda(1/2) = 1/2$. In particular, if preferences are quadratic

$(\sigma = 2)$, $\lambda(\theta) = \theta$. The solution for y is identical, except that the weights are switched around. Thus, the linear weighted policy rules assumed in the previous section, are the limiting expressions of the Nash bargaining solution for an entire class of utility functions (the most natural class of functions to consider in this context).

Parties maximize expected utility, by choosing $\hat{x}$ and $\hat{y}$ respectively, taking into account the solution functions described by the pair of equations (20) and (21). In any Nash equilibrium, they play best responses to each other's choice. Equilibrium, therefore, is described by the pair of first-order conditions:

$$\Pi U^{'}(x-\bar{x}).\frac{dx}{d\hat{x}} + (1-\Pi)U^{'}(y-\bar{x}).\frac{dy}{d\hat{x}} \quad \leq 0 \qquad \text{with} = \text{if} \;\; \hat{x}^{*} > 0 \tag{22}$$

$$\Pi U^{'}(x-\bar{y}).\frac{dx}{d\hat{y}} + (1-\Pi)U^{'}(y-\bar{y}).\frac{dy}{d\hat{y}} \quad \geq \quad 0 \quad \text{with} = \text{if} \;\; \hat{y}^{*} < 1 \tag{23}$$

The model with fixed probabilities outlined above is perfectly well-behaved and guarantees existence and uniqueness of equilibrium under a mild additional assumption. The next Proposition states this.

Proposition **5** *Suppose preferences satisfy increasing absolute risk aversion (i.e, $-U^{''}(z)/U^{'}(z)$ is increasing in z for $z > 0$). Then, for any fixed Π, there exists an unique equilibrium.*

Proof: See Appendix. □

As usual, let us denote equilibrium magnitudes by asterisks (*), and express all values as a function of the fixed probability Π of party X's candidate having greater bargaining strength. Thus, $x^{*}(\Pi), y^{*}(\Pi)$ will denote the contingent policies in equilibrium, for a given value of Π. The next result shows that policy extremism, which was shown to be a possibility in the electoral model, is practically a certainty in the model with fixed Π (unless the spread in possible bargaining power is very small). Before stating the result, let us define an equilibrium to be an interior one if $\hat{x}^{*}(\Pi), \hat{y}^{*}(\Pi) \in (0, 1)$.

Proposition **6** *For all $\Pi \in (0,1)$, and in any interior equilibrium, policies are always extreme, i.e, $x^{*}(\Pi) < \bar{x} < \bar{y} < y^{*}(\Pi)$. Specifically, there exist $\theta_x(\Pi), \theta_y(\Pi)$ such that for all $\theta > \theta_x(\Pi)$, party X exhibits policy extremism, while for all $\theta > \theta_y(\Pi)$, party Y exhibits policy extremism. Moreover, in any interior equilibrium, a decrease in θ (greater bargaining strength to the weaker party) leads to equilibrium policies becoming more extreme, i.e, $x^{*}(\Pi;\theta_1) < x^{*}(\Pi;\theta_2)$ and $y^{*}(\Pi;\theta_1) > y^{*}(\Pi;\theta_2)$ for $\theta_1 < \theta_2$.*

PROOF: See Appendix. □

While the formal proof is in the Appendix, the reason why equilibrium choices will almost always be too extreme, and therefore Pareto inefficient, ex post, is actually very simple. Consider a situation where x and y lie in the range $[\bar{x}, \bar{y}]$. Suppose party X still has "room" to move away to the left, i.e, its current choice of candidate is a type greater than 0. If X chooses a slightly more extreme candidate, then the induced values of x and y both move to the left and closer to X's ideal position, without affecting the relative likelihood of the two outcomes. This is obviously to X's advantage. Continue such a shift till, given $\hat{y}$, $\hat{x}$ is such that x coincides with the ideal point $\bar{x}$, while y is still to the right of $\bar{x}$. A further shift of x and y to the left is still profitable, since the first-order effect of this movement of x is zero, while that of y is positive (since at zero distance, the marginal disutility of a slight increase in distance is zero). The process continues till the trade-off between pushing x further away from $\bar{x}$ and pulling y closer to $\bar{x}$ is exactly evened out, or till $\hat{x}$ reaches the extreme tip 0, whichever comes earlier. The same considerations apply to party Y, hence the result. As a matter of fact, the reaction functions starting at the respective ideal points are, in this case, backward bending, which is the geometric reason why equilibrium outcomes are extreme.

Hence, the inefficiency latent in delegated bargaining stands out starkly when the probability distribution over bargaining strengths is exogenous. More will be said in a moment about how the introduction of an endogenous probability distribution (as in the electoral model of the previous section) alters things. But first, it is worth noting that the fixed probability model by itself could have interesting and realistic applications. We will talk about three scenarios.

1. *Extremism in oligarchies*. Consider an oligarchical political system, where the direction of policy is influenced by two oligarchical factions (e.g, two business groups, or two powerful families), who have conflicting policy objectives and tastes. Each faction must back a politician and her bid to grab power, and can choose what kind of politician to sponsor. The tussle for political upper hand among the sponsored candidates is determined not through votes, but other means, such as financial backing, manipulation and intrigue, or perhaps military support. Both politicians are eventually going to enjoy some degree of influence, but it is impossible to say beforehand who is going to be more powerful. Our results imply that in this kind of a situation, the policy eventually implemented will usually be more extreme than either faction wants it to be.

2. *Ethnic conflict and secessionist movements*. Consider a nation state which contains a

province where an ethnic minority predominates. Suppose there is a dispute regarding the degree of autonomy to be granted to this province. The interval [0, 1] represents various degrees of autonomy, where 0 stands for total political control by the mother state, while 1 stands for secession and complete freedom. It is quite conceivable that the average member of the non-ethnic majority population ideally wants to grant some degree of autonomy ($\bar{x} > 0$), while the average member of the ethnic minority ideally wants something less than full independence ($\bar{y} < 1$), due to economic dependence and possible economies of scale in nation size. However, $\bar{x} < \bar{y}$, so there is some conflict in objectives. Each side selects its representatives or leaders, who have their own opinions and tastes, without knowing how effective or powerful these leaders are going to be in negotiating with the opponent[16]. Our results show that leaders' tastes as well as eventual outcomes may veer much closer to complete secession or total domination than the average public in either group truly wants.

3. *Wage bargaining*. As a last example, consider wage bargaining between a labor union and a firm. The spectrum [0, 1] represents the range of possible wages. Each side may have an "efficiency wage" it would rather see being paid. Workers do not want a wage above $\bar{y}$, since it may depress the return to capital too much, and consequently dry up new investments in plant and technology. Firm owners may not want to pay a wage below $\bar{x}$, since it may lower worker efficiency. Workers elect Union leaders and firms appoint managers to bargain on their behalf. These delegates have preferences of their own, and act accordingly, but are strategically chosen by the two parties in the first place. Once again, the delegated bargaining model presented here predicts that, in equilibrium, Union leaders and negotiating managers will turn out to be radicals within their respective camps, and the wage eventually paid will be either below capitalists' efficiency wage, or above labor's efficiency wage. There will exist alternative wage packages which will improve both average worker welfare, as well as long term profits for capitalists.

The literature on bargaining has often focused on inefficient outcomes. However, the bargaining game typically considered is of the "divide-the-cake" type, where ideal points naturally tend to be 0 or 1. Inefficiency takes the form of costly delays in reaching an outcome. In reality, many important bargaining situations involve both conflict as well as common interest between the parties involved and among the set of alternatives available.

[16]For example, international intervention may be anticipated, without precise knowledge as to which way international opinion is going to swing.

The model presented here captures this richer, non-zero sum nature of much bargaining[17]. The inefficiency that results (surprisingly, almost invariably) here is a result of *delegated* bargaining, and the strategic distortion in agent selection that it entails. Many of the important bargaining situations in real life arise between groups and organizations, in which case the need to negotiate through agents is an inescapable practical necessity. Readers will also note that while standard bargaining models always rely on *asymmetric* information to generate the inefficiency result, this model demonstrates a particularly robust form of inefficiency merely with *uncertainty* (where lack of information is nevertheless symmetric to both sides). It is my conjecture that adding asymmetric information (say, about ideal points) into this model will exacerbate the existing inefficiency by creating, in addition, delays.

As a prelude to the final point in this section, we ask: what specific role do elections play? Having analyzed the equilibrium of the model with fixed probabilities, we now revert to our electoral model of the previous section. By comparing the outcomes in the two models, we can understand the effect of elections on policy outcomes, controlling for other relevant factors.

Proposition **7** (The moderating effect of elections). *Consider an interior equilibrium of the electoral model with given values of the parameters. Let* Π^* *denote the probability of winning for party X's candidate, in this equilibrium. Compare with this the equilibrium of the fixed probability model with* $\Pi = \Pi^*$*, and following the linear policy rule specified in (2) and (3). Equilibrium policy outcomes are always more extreme in the fixed probability model than in the electoral model, i.e,* $x^*(\Pi^*) < x^*$ *and* $y^*(\Pi^*) > y^*$*.*

Proof: See Appendix. □

The intuition behind this result is, again, extremely simple. Recall the discussion following the first-order conditions for parties' choices in the electoral model. We identified two separate effects, one pushing towards selection of more extreme candidates (the policy shifting effect), another pushing towards moderation (the probability shifting effect). Selecting a more extreme or radical candidate shifts the policy outcomes in either eventuality (win or loss) closer to the party's ideal point (unless there is already policy extremism, in which case the adverse outcome becomes better, but the favorable or winning outcome worse). This

[17]Strictly speaking, in the standard bargaining model, since the cake shrinks with time, the game is not literally zero-sum. After all, inefficiencies are not possible in a purely zero-sum world. Nevertheless, the model in this paper includes *intrinsically* inefficient outcomes in the outcome space itself, and shows that typically, the process of delegated bargaining selects from this inferior subset. I think conceptually as well as analytically, this modeling detail makes a difference.

effect favors extremist choices, at least upto a point. On the other hand, selecting a more moderate candidate *improves* the party's chances in gaining a stronger bargaining position by winning at the polls. This factor pushes towards moderation. Without elections, the second factor is entirely absent; hence, choices are resolved towards greater extremism (upto the point where the first effect alone reduces to zero).

This result should remove a possible misperception that might arise from some of the results presented in the previous section. We showed that electoral competition does not necessarily remove the possibility of extreme policies being chosen. Indeed, in some scenarios, the policies implemented will be more extreme than the ones parties would implement if they possessed dictatorial powers from the outset. We show here that this is not *because* of electoral competition but *in spite* of it. Things will be much worse if the battle for political power is resolved not through competitive elections but through any other process which is independent of candidates' policy platforms. The root of the problem is not elections *per se*, but the uncertainty regarding the outcome. This is reassuring, given the *intrinsic* normative appeal of a democracy.

Appendix

Proof of Proposition 5: We will prove the result in the simple case where the bargaining solution functions $x(\hat{x}, \hat{y})$ and $y(\hat{x}, \hat{y})$ take the linear form. The result is also true in the more general case, but is much more cumbersome to write down. It is available from the author on request. First, since the feasible set is compact and payoff functions are continuous, best response correspondences exist. Next, we show that parties' objective functions are concave in their choice variable. Take party X. In the linear case, the second derivative of the objective function with respect to $\hat{x}$ reduces to:

$$\lambda^2 \Pi U^{''}(x - \bar{x}) + (1 - \lambda)^2 (1 - \Pi) U^{''}(y - \bar{x}) < 0$$

Thus, best response correspondences are single-valued, i.e, functions. Further, by the maximum theorem, they are continuous in the opponent's choice variable. Hence, by Brower's fixed point theorem, an equilibrium exists.

Next, we focus on the slope of the reaction functions. Consider values of $\hat{x}$ and $\hat{y}$ in the interior (the proof is easily extended to cover the possibility of non-interior equilibrium). Treating the first-order conditions in (22) and (23) as equalities, and assuming a linear policy rule with parameter λ, we have:

$$\begin{aligned} \lambda \Pi U^{'}(x - \bar{x}) + (1 - \lambda)(1 - \Pi) U^{'}(y - \bar{x}) &= 0 \\ (1 - \lambda) \Pi U^{'}(x - \bar{y}) + (1 - \lambda)(1 - \Pi) U^{'}(y - \bar{y}) &= 0 \end{aligned}$$

On total differentiation of this pair of equations, and using the first-order conditions once more, we obtain:

$$\begin{aligned} \left(\frac{dy}{dx}\right)_X &= -\frac{U^{''}(\bar{x} - x)/U^{'}(\bar{x} - x)}{U^{''}(y - \bar{x})/U^{'}(y - \bar{x})} \\ \left(\frac{dy}{dx}\right)_Y &= -\frac{U^{''}(\bar{y} - x)/U^{'}(\bar{y} - x)}{U^{''}(y - \bar{y})/U^{'}(y - \bar{y})} \end{aligned}$$

In the proof of Proposition 6 below, we will show that (22) and (23) can be simultaneously satisfied (i.e, (x, y) constitutes an equilibrium) only if $x < \bar{x} < \bar{y} < y$. Hence, in any equilibrium, $(\bar{x} - x) > 0$, and $(\bar{y} - y) > 0$. The assumption of increasing absolute risk aversion, coupled with the fact that $\bar{y} > \bar{x}$ implies:

$$\frac{U^{''}(\bar{x} - x)}{U^{'}(\bar{x} - x)} > \frac{U^{''}(\bar{y} - x)}{U^{'}(\bar{y} - x)}$$

Similarly, $(y-\bar{x})>0$ and $(y-\bar{y})>0$, coupled with the fact that $\bar{y}>\bar{x}$ implies

$$\frac{U''(y-\bar{x})}{U'(y-\bar{x})} < \frac{U''(y-\bar{y})}{U'(y-\bar{y})}$$

These two inequalities together imply that the slope of the reaction function of party X is steeper (in absolute value) than the slope of Y's reaction function at any equilibrium point. It follows that there can be only one equilibrium. □

Proof of Proposition 6: By differentiating the solution functions (20) and (21) with respect to $\hat{x}$, we obtain the following expressions:

$$\frac{dx}{d\hat{x}} = \frac{\theta U''(x-\hat{x})}{\theta U''(x-\hat{x})+(1-\theta)U''(x-\hat{y})} \in (0,1) \tag{24}$$

$$\frac{dy}{d\hat{x}} = \frac{(1-\theta)U''(y-\hat{x})}{\theta U''(y-\hat{y})+(1-\theta)U''(y-\hat{x})} \in (0,1) \tag{25}$$

First, consider an interior equilibrium. Then (22) and (23) hold with equality. Suppose $x^*, y^* \in [\bar{x}, \bar{y}]$. The derivative terms ($dx/d\hat{x}$, etc.) are all positive from (25) and (26) above, and hence the left hand side of (22) is negative, since $U'(x^*-\bar{x})<0$ and $U'(y^*-\bar{x})<0$. Condition (22) is then not satisfied. The same discrepancy arises in either (22) or (23) as long as either $x^*, y^* > \bar{x}$ or $x^*, y^* < \bar{y}$. The case of $y^* < \bar{x} < \bar{y} < x^*$ can be ruled out, since in that situation, each party gains by moving its candidate closer to its ideal point. The only remaining case is the one stated in the Proposition: $x^* < \bar{x} < \bar{y} < y^*$.

For the comparative static result, suppose we are in an interior equilibrium, and θ decreases. Observe from (25) and (26) that this leads to an increase in $dy/d\hat{x}$ and a decrease in $dx/d\hat{x}$, for given x, y. Coming to the first-order condition in (22), this means an increase in the absolute value of the negative (second) term, and a decrease in the value of the positive (first) term. Consequently, the expression on the left hand side falls below zero. This implies that $\hat{x}$ must fall, and consequently also x. Therefore, the best response function of party X shifts "down" in response to a fall in θ. Exactly similar reasoning leads to the conclusion that the best response function of party Y must shift up. Given negative slopes and the nature of the intersection of the two curves at the equilibrium point, it follows that the values of x^* in the new equilibrium must fall, and that of y^* increase, proving the result.

Finally, consider a non-interior equilibrium, where $\hat{x}^* = 0$ to begin with. If θ decreases further, $\hat{y}^*$ is non-decreasing, and so is $\hat{x}^*$. Thus, the equilibrium value of x^* must rise from this point onwards. Hence, there exists a $\theta_x(\Pi)$ such that $x^* > \bar{x}$ if and only if $\theta < \theta_x(\Pi)$. By exactly same reasoning, there exists a $\theta_y(\Pi)$ such that $y^* > \bar{y}$ if and only if $\theta < \theta_y(\Pi)$. This proves all the statements in the Proposition. □

Proof of Proposition 7: Using (10), party X's reaction function in the electoral model, we can write

$$\Pi^* U^{'}(x^* - \bar{x}) + (1 - \Pi^*) U^{'}(y^* - \bar{x}) = \frac{d\Pi(x^*, y^*)}{dx}.[U(y^* - \bar{x}) - U(x^* - \bar{x})]$$

Equality applies since the equilibrium is assumed to be interior in the statement of the Proposition. Since the derivative of the probability function is positive and $y^* > x^*$, the expression on the right hand side is positive. Hence, so is the one on the left hand side. Now observe that in the fixed probability model, best response condition for X (see (22)) requires that the expression on the left hand side be zero. Due to concavity of the expected utility of X (for fixed Π), it follows that $\hat{x}$ (and x) must be lower to restore the value of the expression on the left hand side to zero. This means that that in the fixed probability model, the point (x^*, y^*), equilibrium of the electoral model, lies to the right of the reaction function of party X. Similar reasoning shows that (x^*, y^*) also lies below the reaction function of party Y. Given the negative slope of these reaction functions, elementary geometric considerations deliver the result. $\square$

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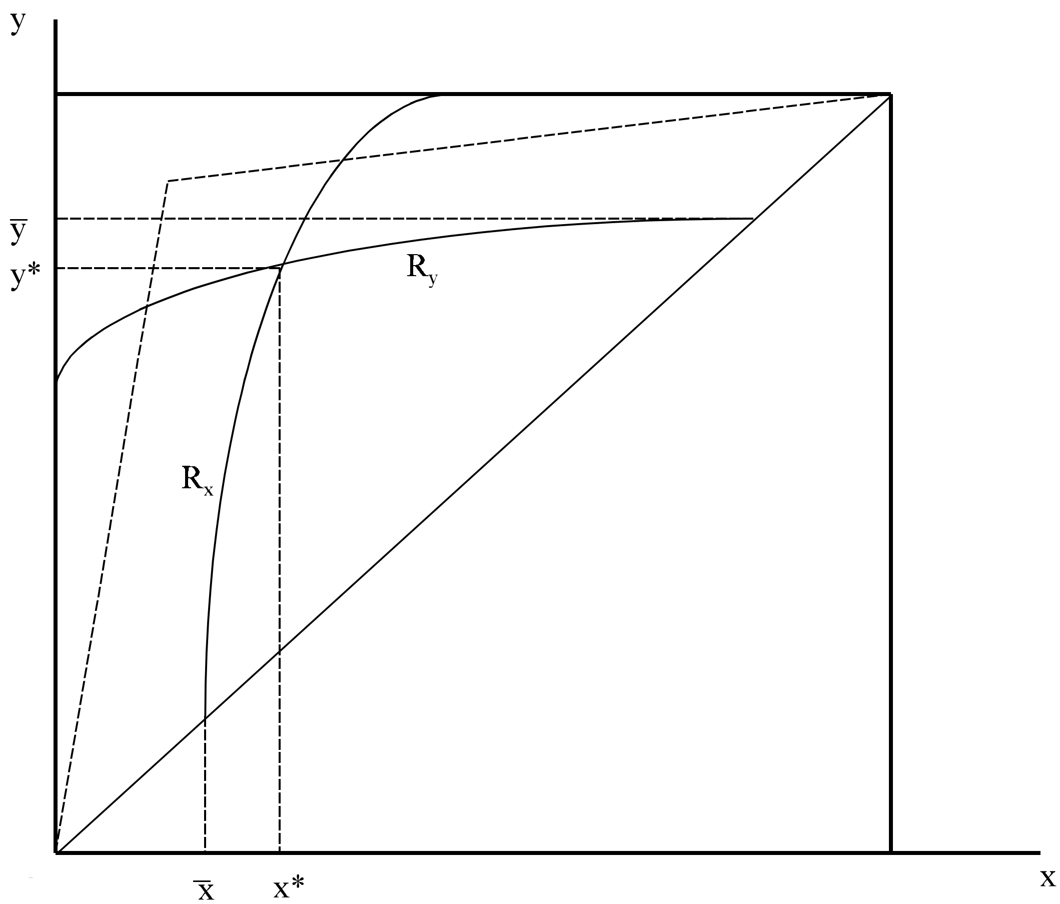

Figure 1(a): An interior equilibrium.